

## **Ship Performance Measurements – Houston Ship Channel, Galveston Bay, Texas**

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### **PROJECT DESCRIPTION**

Study Purpose. The purpose of the study was to record and document data that defines ship motions (both horizontal and vertical) during transits in the Houston Ship Channel, particularly the Galveston Bay reaches, and the relevant environmental and ship control factors that influence these ship motions. These measurements combined with ship characteristics and channel conditions will provide data that can be used to better understand ship behavior and controllability in confined waterways and to verify numerical ship models. Since the ships measured will be operating through both a 400-ft x 40-ft channel and a 540-ft x 45-ft channel, these measurements will provide comparative data in two channel sizes. The results will be useful for improving the safety of present and future operations in the Houston Ship Channel. No special analysis of these data is included in this effort.

Basic Approach. The collection of accurate position (vertical and horizontal) data on ships in Galveston Bay from Barbers Cut to the intersection with the Gulf Intracoastal Waterway was the focus of this study. In addition, hydrographic data, water level, wind, and ship descriptive parameters, controls, and maneuvering characteristics were collected. From these data, ship tracklines, sinkage, and trim were computed. All

records, data (both raw and reduced) and notes were organized and have been made available in Microsoft Excel worksheets in order to prepare for further analysis of these data in future studies.

**Ships Measured.** Twenty-five ships were measured during this project between July 16 and July 31, 2001. The ships measured are shown in the figure below. Included are the ship's principle characteristics and pertinent information about the ship data collected. These ships included 13 tanker/bulk carriers, 9 containerships, 2 OBO ships, and one general cargo ship. Eleven of the ships had beams greater than 129 ft. Of the nine meeting situations that were accomplished with both ships instrumented, four had a combined beam less than 212 ft and five had combined beams of greater than 240 ft. Five of the transits had survey boat water level measurements. Seven of the transits had velocity measurements taken at the specified cross-sections.

**PROGRESS TO DATE:** First phase of the study is complete and a draft report is available entitled as the project title and dated July 10, 2001.

**FUTURE PLANS:** Proposals will be prepared to evaluate this data. A proposal has been submitted to SNAME to develop a procedure for evaluating ship controllability. The data is available for others to use in research.

**PRODUCTS:** A draft report is available that contains a CD-ROM with all the data.